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# WETLANDS ADDENDUM

# OUTDOORS NORTH CAROLINA

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# WETLANDS ADDENDUM

OUTDOORS NORTH CAROLINA
1984-89

JANUARY, 1988

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The protection of North Carolina's wetlands involves many different agencies. This report represents an initial attempt at identifying the various agencies involved with wetlands and describing their wetland involvement and concerns. Appreciation is expressed to the following individuals who contributed to the preparation of this report:

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# INTRODUCTION

Prior to the mid-1970s, wetlands were considered wastelands, and conversion to other uses was actively encouraged. Wetland areas have been drained, dredged or altered in an attempt to improve their economic usefulness, lessen flood damage, and eliminate mosquito breeding swamps. They have often been converted to agricultural use or served as disposal sites for fill or dredge material. Consequently, wetlands have been altered or destroyed at an alarming rate.

Various sources estimate that between 33 and 60 percent of the wetlands in the conterminous 48 states have been destroyed since European settlement. The continuing elimination of wetlands, estimated at 300,000 to 500,000 acres annually, will result in high environmental and long-term economic costs to the Unites States.

Awareness of the multiple public values of wetlands has developed slowly. Increasingly, however, wetlands have begun to receive recognition as precious ecological resources that nurture wildlife, assist ground water recharge, purify polluted waters, check the destructive power of floods and storms, provide food supply, contribute to our economy, and provide varied recreational activities. This changing perception is resulting in increased interest in the protection of wetlands.

In spite of increased awareness of the aesthetic, economic, recreational, and ecological values of wetlands, pressure to convert wetlands to other uses is still significant.

Conflicts still exist between those that want to convert wetlands and those who feel they should be left in their natural state.

The Emergency Wetlands Act of 1986 (Public Law 99-645), signed into law on November 10, 1986, has as its purpose the promotion, in concert with other Federal and State statutes and programs, of the conservation of wetlands in order to maintain the public benefits they provide. The Act provides for Federal wetlands acquisition and highlights the use of Land and Water Conservation Fund (LWCF) monies for acquisition of wetlands for public outdoor recreation.

The Act also requires that each State, starting in fiscal year 1988, address wetlands as an important outdoor recreation resource. To meet that requirement, the wetlands priority plan on the following pages is prepared as an addendum to the existing North Carolina Statewide Comprehensive Outdoor Recreation Plan (SCORP).

# CHAPTER I

# IDENTIFICATION AND ROLES OF WETLAND AGENCIES

## FEDERAL WETLAND AGENCIES AND ROLES

Wetlands are directly and indirectly affected by a variety of federal programs largely developed during the last two decades. These programs affect wetlands through regulation, acquisition of interests in land, and general policy guidelines as shown in Table I.

Table I

Major Federal Programs Affecting the Use of Wetlands in North Carolina

| Program or Act | Primary Implementing Agency | Effect of Program |
|---|---|---|
| Section 404 of the Clean Water Act (1972) | U.S. Army Corps of Engineers Department of Defense (COE) | Regulates many activities that involve disposal of dredged or fill material in waters of the United States, including many wetlands |
| Section 401 of the Clean Water Act (1972) | U.S. Environmental Protection Agency (EPA) | Requires State to set water quality standards and issue certification for discharges into waters |
| Section 402 of the Clean Water Act (1972) | U.S. Environmental Protection Agency (EPA) | Regulates point source pollutants into waters of U.S. through State program |
| Migratory Bird Hunting and Conservation Stamps (1934) | Fish and Wildlife Service (FWS) Department of the Interior (DOI) | Acquires or purchases easements on wetlands from fees paid by hunters for duck stamps |
| Federal Aid to Wildlife Restoration Act (1937) | FWS | Provides grants to States for acquisition, restoration, and maintenance of wildlife areas |

Table I (continued)
Major Federal Programs Affecting the
Use of Wetlands in North Carolina

| Program or Act | Primary Implementing Agency | Effect of Program |
|---|---|---|
| Land and Water Conservation Fund (1955) | FWS, National Park Service (DOI) | Acquires wildlife areas |
| U.S. Tax Code | Internal Revenue Service (IRS) | Provides deductions for donors of wetlands and to some not-for-profit organizations |
| Executive Order 11990 Protection of Wetlands (1977) | All Federal Agencies | Minimizes impacts on wetlands from Federal activities |
| Executive Order 11998 Flood Plain Management (1977) | All Federal Agencies | Avoids flood plain development where practical |
| Coastal Zone Management Act (1972) | National Oceanic and Atmospheric Administration, Department of Commerce | Provides Federal funding for coastal wetland programs in most coastal States |

## The U.S. Army Corps of Engineers

The Corps of Engineers has as its responsibility two regulatory programs, Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Federal Water Pollution Control Act of 1972. These two programs regulate wetland activities through the issuance of permits.

Section 10 requires permits for the dredging, filling, or obstruction of "navigable waters," defined as the mean high water mark by the Corps. Although wetland protection is not a stated goal of Section 10 permitting, Section 10 has served to protect wetlands below the mean high water mark and within navigable waters from some negative impacts.

The second permit program under which the Corps of Engineers regulates wetland activities in Section 404 of the Clean Water Act.

Under Section 404, permits are required for discharges of dredged and fill materials into the "waters of the United States." This program is the primary means of Federal involvement in controlling the use of wetlands.

When a permit is applied for, the Corps of Engineers prints the proposal in the form of a public notice. It is then distributed to appropriate interested state and federal agencies. These would normally include state agencies such as the North Carolina Wildlife Resources Commission and the Divisions of Coastal Management, Soil and Water Conservation, Environmental Management, Water Resources, Parks and Recreation, Forest Resources, and Marine Fisheries of the Department of Natural Resources and Community Development. The U.S. Fish and Wildlife Service, the Environmental Protection Agency and the National Marine Fisheries Service would also receive copies of the proposal. Most of these agencies will investigate the proposal and then submit reports to the Corps regarding the proposal's effects.

The Corps receives and reviews the comments and recommendations along with its own concerns in making the final decision as to whether or not to issue a permit. Reviewing agencies may recommend changes to project plans in order to lessen any adverse impacts. If a project's impact on the environment is deemed significant, the permit application can be denied. The project can also be modified to minimize impacts, or the permit applicant can purchase or restore other wetlands to compensate for project impacts. Through this permitting system, the 404 program provides broad regulatory authority over many types of development activities in wetlands.

The Corps conducts wetlands research, primarily through its Waterways Experiment Station. Research to improve and standardize techniques to assist Corps personnel in the identification and delineation of wetlands (Environmental Laboratory, 1987) to access and quantify wetland values for use in evaluating permit applications, and to develop techniques for wetland restoration are research priorities.

The U.S. Fish and Wildlife Service

The Fish and Wildlife Service (FWS) reviews proposals for Corps permits with an eye towards how a particular project will affect fish and wildlife. The Fish and Wildlife Service is the federal agency responsible for preserving, protecting, and enhancing wildlife and fresh water fisheries resources. This responsibility is the reason for the agency's involvement in the review of Corps permits. The FWS considers concerns such as the protection of productive habitats for commercial and sport species, effects on water quality, protection of vegetation, and publi rights of access, use, and enjoyment in making its review.

The Fish and Wildlife Coordination Act requires that wildlife conservation be given consideration equal to the concern for other aspects of water resource development projects in which the Corps and other Federal agencies are involved. Under the act, the FWS is empowered to evaluate the impact on fish and wildlife of all new federal projects and federally permitted projects, including those permitted under Section 404. The authority granted under this act has been used to limit adverse impacts on wetlands projects involving federal funding or needing federal permits. The FWS also aids in the development of

regulatory programs for the discharge of dredged and fill material into wetlands adjacent to waters of the U.S.

The FWS, under section 208 of the Clean Water Act, has statutory authority for the National Wetlands Inventory (NWI). The NWI mapping for North Carolina is only approximately 25 percent finished. As of October, 1987, the FWS will be taking over the responsibility for completion of the NWI from the North Carolina Soil and Water Conservation Division.

The FWS is also developing a National Wetlands Priority Conservation Plan to assist in the identification of types and locations of wetlands, and interests in wetlands warranting consideration for federal and state acquisition in accordance with Section 301 of the Emergency Wetland Resources Act of 1986. Implementation of the plan will result in development of lists of wetlands warranting priority consideration for acquisition. The plan will apply to wetlands acquired by federal agencies and wetlands acquired by the states with Land and Water Conservation Fund grants.

The FWS also participates in wetland protection through several programs which are involved in the acquisition of wetlands or interests in wetlands. Through the sale of Migratory Bird Hunting and Conservation Stamps, waterfowl habitat is purchased, a large portion of which is wetlands. Since 1965, the Land and Water Conservation Fund has been used as a funding source to protect endangered species and important natural resource areas, an unknown portion of which are wetlands. In addition, the FWS, through the Federal Aid to Wildlife Restoration Act of 1937, provides grants to states for the

acquisition, restoration, and maintenance of wildlife areas, including wetlands. As of 1987, the FWS managed approximately 257,000 acres of wetlands in North Carolina.

Wetlands research is the primary focus of FWS research programs; and related studies may be conducted on endangered species, fisheries, and wildlife. Research projects have included a computerized bibliography of literature on wetland values (coordinated with the Corps), a list of wetland soils and plants, an assessment of the ecological impacts of disposing of wastewater on wetlands, and an evaluation of mapping-display technology.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS), like the FWS, is empowered by the Fish and Wildlife Coordination Act to evaluate the impact on marine fish and wildlife of all new federal projects and federally permitted projects. This review authority also includes projects permitted under Section 404. By its comments and recommendations, the NMFS attempts to limit adverse impacts on wetlands. The NMFS also conducts estuarine habitat research involving both ecological studies and pollution related studies.

Environmental Protection Agency

The Environmental Protection Agency (EPA) works to protect wetlands through its objective to restore and maintain the chemical, physical, and biological integrity of the nation's waters. EPA's program of water pollution control is based upon the Federal Water Pollution Control Act, also known as the Clean Water Act.

The act requires each state to set water quality standards for every significant body of surface water within its borders. These water quality standards represent the goals which pollution controls are meant to secure.

To curb point source pollution, the Act requires that all publicly owned municipal sewage systems provide secondary treatment of wastewater before discharge. EPA provides construction grants to states which, in turn, allocate the money to local governments to assist in the upgrading or construction of new treatment facilities. To assure that communities meet treatment requirements, sewage facilities must secure permits under the National Pollution Discharge Elimination System (NPDES). Industries discharging pollutants into waterways are also subject to control requirements and NPDES permits.

EPA assists the states in their planning of pollution control strategies through the Water Quality Management Program. EPA is also involved with wetland protection through its joint responsibility with the Corps of Engineers for protecting waters against degradation and destruction caused by disposal of dredged spoils or fills. Permits to carry out dredge and fill activities are granted by the Corps of Engineers, subject to EPA approval. EPA has veto authority over any proposed sites for disposing of dredge or fill material if it finds project impacts unacceptable.

Water quality protection is enhanced by nearly all of the laws EPA administers. Air pollution controls, for example, keep harmful pollutants from entering the water from the atmosphere. Through its varied water protection efforts, EPA plays a major role in the protection of wetlands.

In 1986, the EPA made the 19 counties of the Albemarle and Pamlico Sounds a special case area; and in these counties the EPA will be making wetland determinations on 404 permit applications involving pocosins. The area is currently under heavy development pressures from large agricultural interests, forestry interests, and mining pressures.

Soil Conservation Service, U.S. Department of Agriculture

The Soil Conservation Service (SCS) has, since passage of the "swampbuster" provision of the 1985 Farm bill, become more involved with wetlands. The provision gave protection to wetlands by causing farmers who convert wetlands to lose all U.S. Department of Agriculture crop supports. The SCS conducts field studies of vegetation and consults soil maps to determine wetland boundaries.

This legislation helps correct federal policy which in the past--primarily through farm supports and tax codes--has encouraged wetland conversions. It also offers additional protection to freshwater wetlands.

Summary of Federal Wetland Involvement

In summary, at present, no federal laws specifically protect wetlands, although several federal programs and policies offer some protection for wetlands. The Corps of Engineers' program to implement Section 404 of the Clean Water Act provides the primary means of feder involvement in controlling the use of wetlands by regulating discharges of dredged or fill material.

The FWS, the EPA, and the NMFS have all interpreted the Clean Water Act's mandate as an obligation to protect the

integrity of wetlands, including their habitat values. The Corps, however, has viewed its primary function as protecting the quality of water and does not see Section 404 as specifically protecting wetlands. Instead, the permit process attempts to balance a number of competing values, not just the presence of wetlands.

Federal agencies are also involved in wetlands through state and local assistance, federal land management, construction projects, wetland research, and agricultural conversion policies. All of these federal programs are affected by President Carter's two executive orders which established flood plain management and wetland protection as the official policy of all federal agencies.

Executive Order 11990, Protection of Wetlands, mandated federal agencies to "take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands...." The order directed federal agencies to avoid undertaking new construction or assisting construction in wetlands if practical alternatives existed. If wetlands were affected, the order required that all practical measures to minimize negative impacts be taken.

Executive Order 11998, Flood Plain Management, directed federal agencies to avoid direct or indirect support of flood plain development where practical alternatives exist. Insofar as many wetlands are located in flood plains, this order could influence much wetland development.

## STATE WETLAND AGENCIES AND ROLES

Numerous state agencies are involved with wetlands. Most of these are within the Department of Natural Resources and Community Development. Wetland protection is sometimes a primary concern of these agencies, but more often, the concern for wetlands stems from wetlands being connected with other primary program concerns.

### Division of Coastal Management, Department of Natural Resources and Community Development

The Division of Coastal Management administers two State laws which have regulatory authority over development in North Carolina's wetlands. These laws provide wetland protection which is concentrated in coastal wetlands, especially marshes in the 20 coastal counties. The North Carolina Dredge and Fill Act (1969) requires permits for "excavation or filling begun in any estuarine waters, tidelands, marshlands, or state-owned lake." It is administered concurrently with the North Carolina Coastal Area Management Act (1974).

The Coastal Area Management Act (CAMA) seeks to use coordinated management to control development pressures in an effort to preserve "the features of the coast which make it economically, aesthetically, and ecologically rich...." Overseeing the implementation of the CAMA is the North Carolina Coastal Resources Commission, a 15-member board appointed by the Governor, with each member representing various coastal interests and occupations.

Part of the Coastal Resources Commission's responsibility is identifying the most sensitive and productive coastal lands and

waters, areas in which uncontrolled development might cause irreversible damage to property, public health, and the natural environment. These areas, known as Areas of Environmental Concern (AEC), contain natural hazards or environmental, economic, or social values that are of concern to the State as a whole.

Four categories of AEC have been designated: The estuarine system - all waters of the coastal sounds, rivers, and shorelines; the ocean hazard system - lands adjacent to the Atlantic Ocean subject to erosion and/or flooding; public fresh water supplies; and natural and cultural resource areas - five nomination categories of uniquely coastal features. The AEC cover almost all coastal waters and 3 percent of the land in the coastal counties.

To protect the Areas of Environmental Concern, the Coastal Resources Commission determined what types of development activities can take place without harming the natural system. A permit program based on standards to guide development within the AEC was then developed. CAMA permits require that specific environmental regulations be followed before any land or water disturbing activities take place within the AEC.

The intent of CAMA's permit program is not to stop development, but rather to make sure that development within AEC does not threaten public safety or the continued productivity and value of important natural areas. Approximately 97 percent of the permits applied for under CAMA are issued. However, CAMA permits require an obligation and a responsibility to meet the

Coastal Resources Commission's guidelines for development in an AEC. If these guidelines are not being followed, then the permits will be revoked; a fine may also be imposed if the work has harmed the State's coastal resources.

Projects that require federal permits or any form of federal authorization which are being proposed in the 20 coastal counties are reviewed by the Division of Coastal Management for consistency with the North Carolina Coastal Management Program. These reviews are mandated as a result of North Carolina receiving federal approval of its coastal management program under the U.S. Coastal Zone Management Act of 1972. Under the act, federal agencies cannot issue a permit for a project if it is found to be inconsistent with the state program.

Finding that a project is consistent with the state program does not mean that the federal permit must be issued. While a negative statement from the State will prevent an applicant from obtaining a permit, a positive statement does not guarantee that the federal agency will act accordingly. The major federal permits reviewed for consistency with the Coastal Management Program are Section 20 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and U.S. Coastal Guard permits for the construction or modification of bridges and causeways over navigable waters. A joint permitting process allows a project permitted by CAMA to automatically receive a Section 404 permit.

The Division of Coastal Management is the state agency responsible for preparing a State response for federal permit applications in the 20 coastal counties. This involves

coordinating and obtaining comments from eleven other state agencies which review applications to ensure that proposed projects meet state law requirements. This review is the basis for determining whether or not a project is consistent with the Coastal Management Program. The Division is also responsible for coordinating the State viewpoint on projects outside the 20 coastal counties, where only Section 404 regulates wetlands.

The Division of Coastal Management also is involved in wetlands protection through the creation and maintenance of estuarine sanctuaries along the coast. This program, the North Carolina National Estuarine Research Reserve, consists of 12,000 acres of barrier islands, salt marshes, and tidal waters - habitat for hundreds of species of fish, birds, and other wildlife. The areas serve as a natural outdoor laboratory where scientists, students, and the public can study estuarine dynamics and learn about coastal natural areas.

Established in 1982, the reserve is a collection of four representative estuarine ecosystems along North Carolina's coast. It is part of the National Estuarine Reserve Research System created by Congress in the 1970s as rapid development along the nation's coasts was reducing the number of undisturbed estuaries. The national program, administered by the National Oceanic and Atmospheric Administration, provides states with matching funds to set up reserves which will ensure that natural estuarine areas are available for scientific research and public education.

The specific goals of the North Carolina National Estuarine Research Reserve are:

- To preserve estuarine areas characteristic of North Carolina's coast and make them available for study of the processes, functions and influences which shape and sustain estuaries.
- To provide new information on estuarine ecosystem processes and influences to decision makers as a basis for the sound management of coastal resources.
- To increase public awareness and understanding of estuarine ecosystems by providing areas where people can directly observe the importance of estuaries to the state and county and how they are affected by human activities.
- To provide for traditional uses of estuarine areas, such as hunting and fishing, which will not disturb the reserve environment and are compatible with the research and educational activities taking place there.

North Carolina's estuarine system - the third largest in the nation and the fourth most productive - is exceptionally diverse. It lies within two biogeographic regions, the Virginian and the Carolinian, and has many different salinity regimes, basin types and tidal patterns.

Of the $4 million maximum available from NOAA, the State has received to date approximately $2.55 million in matching funds for its Estuarine Research Reserve program. Additional funds have been requested to continue acquisition efforts and operation and maintenance of the program.

Division of Soil and Water Conservation, Department of Natural Resources and Community Development

The Division of Soil and Water Conservation's primary involvement with wetlands has been its work in wetlands mapping. North Carolina entered the National Wetlands Inventory (NWI) program of the U.S. Fish and Wildlife Service (FWS) in September, 1983. The mapping, photointerpretation, and field verification of wetlands was the responsibility of the Division of Soil and Water Conservation (SWC). The FWS supplies the aerial photography and final cartography. The coastal plain of North Carolina has been designated the top priority area for NWI mapping by the Southeast Regional Office of FWS.

At the end of the cooperative agreement between the Department of Natural Resources and Community Development and the FWS (September 30, 1987), the responsibilities for photointerpretation and mapping were shifted from the SWC to the FWS or a contractor selected by them. This change in responsibilities resulted from a slow map production by the State, which never provided the funds for an adequate staff or facilities to meet FWS goals of having the entire coastal plain mapped by September, 1988. The SWC will be responsible for field verification and other quality control work for these maps.

The shift in mapping responsibilities will permit the wetlands specialist within the SWC to expand the wetlands program. The wetlands specialist prepares public information materials on wetlands, evaluates wetland impact of development projects, reviews environmental impact documents, and assists in

the design of wetlands research projects. One goal of the division is to interact more with state and federal agencies on wetlands-related topics.

Division of Forest Resources, Department of Natural Resources and Community Development

The Division of Forest Resources has not been directly involved in the planning, monitoring, or regulation of the use of wetland resources in North Carolina. Wetlands involvement has been through the review of environmental documents which are received from the Department of Natural Resources and Community Development's Planning and Assessment Division or the State Clearinghouse and in promoting forest practices related to water quality.

The Division adheres to the current Forest Practices Guidelines Related to Water Quality. The guidelines consist of best management practices, and they are used in making silvicultural recommendations to forest woodland owners and in silvicultural operations. These best management practices include properly designing, constructing, and maintaining roads and stream crossing, culverts, and bridges; revegetation with trees or cover crops; preservation of filter strips along waterways; and prescribed burning and wildfire control techniques. Landowners are also encouraged not to engage in forest management activities in critical types of wetlands such as very deep organic soil pocosin areas or to convert bottomland hardwoods to pine plantations.

The Division administers a cost-sharing program to reduce runoff in these nutrient-sensitive areas of the State: Falls

Lake, Chowan River, and Jordan Lake. The program will reimburse up to 75 percent of costs for approved practices which reduce the movement of nutrients and sediment into waterways.

Forest Resources also manages some land which includes wetland areas. One such area, approximately 4,000 acres of wetlands at Bladen Lakes State Forest, has been registered as a Natural Heritage Area and set aside for preservation and protection.

Division of Marine Fisheries, Department of Natural Resources and Community Development

More then 90 percent of the annual commercial fisheries landings in North Carolina is comprised of estuarine-dependent species. These species, such as summer flounder, red drum, striped bass, shrimp, blue crabs, oysters, and hard clams utilize the estuary for spawning, early growth, or feeding during some or all of their life cycle. The wetlands surrounding the estuaries provide the basis of the system's productivity; thus, they are critical to the ongoing productivity of the fisheries.

The Division of Marine Fisheries (DMF) is charged with management of the State's estuarine and marine fisheries (General Statute 113-131, 113-132, 113-181). This tasks includes research, enforcement, and enhancement. Division staff conduct long-term research activities on fisheries resources and the estuarine habitat supporting those resources. Some of the results of that work includes delineation of primary and

secondary nursery areas, most of which are surrounded by wetlands. The Marine Fisheries Commission (MFC) designates such areas by regulation (NCAC 3B.1400), and prohibits specific fishing practices in such areas. The Coastal Resources Commission recognizes the MFC designations and prohibits or severely limits habitat alteration projects in designated areas.

Another function is reviewing habitat alteration permit applications. The DMF comments from the fisheries perspective, both for the resource and for the users.

The Department's Submerged Lands program, operating under General use of Statutes 113-205 and 113-206, was transferred to DMF in March, 1987. Under this program, the staff is trying to resolve the validity of approximately 6,400 claims to submerged lands filed in the late 1960s. Many of these claims include extensive areas of salt marsh and other wetlands.

In summary, the DMF seeks to promote wise use of North Carolina's estuarine resources and their underlying wetlands habitat for the long term.

Division of Parks and Recreation, Department of Natural Resources and Community Development

The Natural Heritage Program, a unit of the Division of Parks and Recreation since 1976, has compiled and maintained a statewide inventory of exemplary and unique natural community types, wildlife habitats, and rare and endangered species locations. A high percentage of these ecological resources are associated with wetlands. Many of the sites on the priority list of natural areas are wetlands. A list of high priority areas and recommendations for their protection are compiled annually. The

program has developed a classification system for natural community types in the state, which covers all wetlands vegetational associations.

The program administers the State Registry of Natural Heritage Areas (now including 230 voluntarily protected natural areas) and arranges for dedication of State Nature Preserves. Many of the protected natural areas contain important wetlands. Registered areas include approximately 30,000 acres of wetlands in private ownership, and approximately 53,000 acres in public ownership.

Registry, however, is a non-binding, non-regulatory program which recognizes landowners for being good conservationists and awards certificates in appreciation of their stewardship. An eligible natural area is entered on the registry only after the owner voluntarily agrees to its designation.

The Natural Heritage Program works cooperatively with various federal and state agencies and private organizations in its identification and protection efforts. The wetland types considered to be the top priority by the Heritage Program are Carolina bays, bottomland swamps, and mountain and piedmont bogs. Other areas of concern are pocosins in the northeastern part of the State. The focus on freshwater wetlands stems from the lack of protection that freshwater wetlands are afforded.

The Division of Parks and Recreation, in its management of state parks, recreation areas, natural areas, and natural and scenic rivers is involved in the acquisition and protection of

wetlands. Wetland areas are sometimes only portions of larger park areas; in other locations, wetlands are a major focus of the resource and comprise the bulk of the park or natural area.

Division of Environmental Management, Department of Natural Resources and Community Development

The Division of Environmental Management aids the protection of wetlands by regulating water quality standards. Under Section 401 of the Clean Water Act, the Division issues permits relating to water quality aspects of projects when federal permits are required and when there is a discharge of pollutants into waters. Before pollutants can be placed in waters, a certification from the State which indicates that placing the pollutant will not violate State water quality standards is necessary. If a 401 certification is not obtained, a 404 permit cannot be issued. Also, 401 certifications are required for Corps nationwide permits.

If no federal permit is required, then a 401 water quality certification is not needed. Most 404 permits require 401 certification before the 404 is issued. The 401 certification process is coordinated with the Corps and CAMA. For example, in the 20 coastal counties under CAMA jurisdiction, there is a joint application form, joint public notice, and single place to apply for the required permits.

There are general water certifications under the 401 program which exist for such activities as filling behind bulkheads, rip-rap placement, boating ramp placement, drainage from upland dike disposal areas, bridge replacement, and sewer line

construction. Each of these activities has restrictions or requirements to assure water quality protection.

The 401 process, by protecting water quality, serves to protect wetland resources. Because 401 certification is only required for discharges needing federal permits, inland and isolated wetlands are afforded less protection than other wetlands.

The Division of Environmental Management also serves to protect water quality through the issuance of National Pollution Discharge Elimination System (NPDES) permits. These permits regulate the discharge of wastewater from sewerage treatment plant and industrial waters. Non-discharge permits are also required for wastewater treatment lines and spray disposal systems.

The Division is also involved with wetland protection through its review and opportunity to comment on projects which need various permits and which require environmental review. DEM works closely with the EPA and other state and federal agencies.

Division of Land Resources, Department of Natural Resources and Community Development

The Land Quality Section of the Division of Land Resources implements laws pertaining to safety of non-federal dams, erosion and sediment control on construction sites, and responsible operation and reclamation of mines in North Carolina. The North Carolina Dam Safety Act of 1967 requires that the State approve detailed engineering plans for construction and modification of dams over 15 feet high, impounding more than ten acre feet. The

focus of the Act is on construction techniques for dam safety. Dam construction or modification may require 404 permitting.

The North Carolina Sedimentation Pollution Control Act of 1973 is designed to protect the State's streams and lands from degradation by soil eroded from construction sites. Sediment is the largest single pollutant in the State by volume; it reduces populations of game fish, acts as a carrier of toxic materials, and reduces the quality and volume of public water supplies and recreational reservoirs. The Land Quality Section approves and monitors sedimentation control plans for disturbed areas of over one acre and works with the Corps of Engineers in cases where 404 permitting is required.

The North Carolina Mining Act of 1971 provides for responsible development of mineral resources and requires a mining permit to mine any surface area larger than one acre. If a 404 permit is required and not obtained, mining cannot proceed. The mining permit includes conditions to assure environmental protection during mining and to assure the land will be reclaimed for a useful purpose after mining is completed. Types of mining operations throughout the State vary, and such activities may or may not be located in wetlands.

Mining operations which would have the greatest potential impact on wetlands would be the mining of peat from pocosin areas in the eastern part of the State. To date, this impact has been minor. Litigation is in progress which might determine the extent of impact which peat mining will have on State wetlands.

Where mining involves wetland areas, the Land Quality Section works with CAMA and the Corps to avoid or lessen impacts on wetlands.

Wildlife Resources Commission, Department of Natural Resources and Community Development

The North Carolina Wildlife Resources Commission's (WRC) primary involvement with wetlands comes from its review of applications for 404 permits. The WRC is concerned with inland fish and wildlife and their habitats, and 404 reviews are performed from this perspective. WRC 404 permit review and concerns closely parallel those of the U.S. Fish and Wildlife Agency, and the two agencies sometimes work together in conducting joint field investigations. The WRC, unlike the FWS, cannot elevate a permit.

The WRC manages 1,850,000 acres of game lands in North Carolina, approximately one-half of which is U.S. Forest Service land located in the western part of the State. While the majority of these lands are not wetlands, it is estimated that between 100,000 and 150,000 acres are.

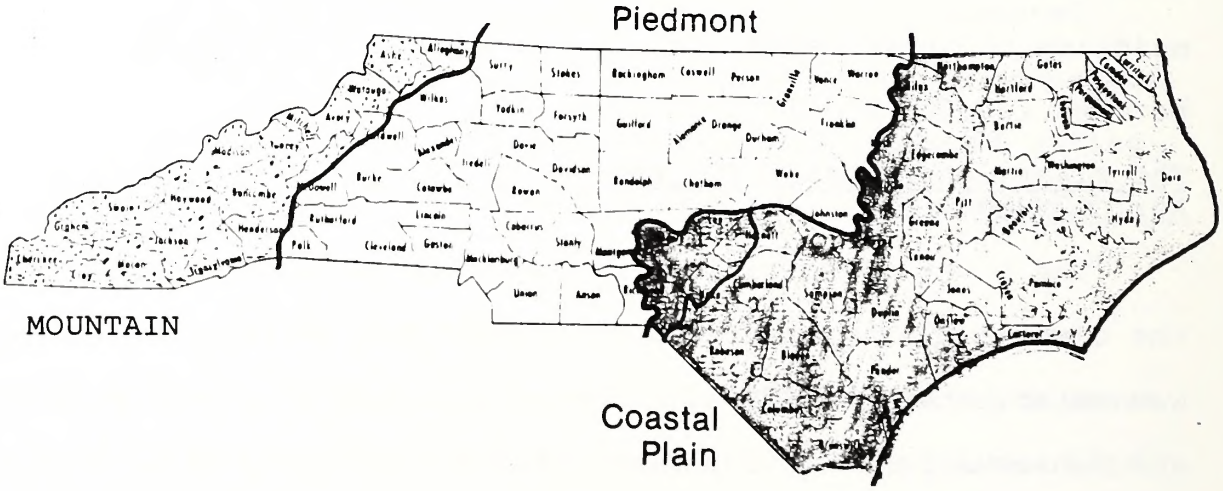
The Plant Conservation Program, North Carolina Department of Agriculture

The Plant Conservation Program helps preserve rare plants in the coastal plain region and throughout the State. The program was established in 1979 with the passage of the Plant Protection and Conservation Act. The Plant Conservation Program is responsible for the monitoring, surveillance, listing, and protection of North Carolina's rare and endangered plant species.

While the Plant Protection Program does not have a direct focus on wetlands, wetlands are very much a concern of the program. In its concern for rare and endangered plant species in the State, the program must be concerned with rare habitats, and many of these habitats are wetland areas. The program serves as a Clearinghouse review agency, and in this role is able to insure that endangered and threatened plant species are considered in project evaluations.

In the mountain region of the State, an estimated 40 percent of rare or endangered plant species are found in wetland areas. Mountain bogs and seepages provide the majority of these habitats for disjunct and endemic species, although wet mountain meadows and gorge areas provide other such habitats.

REGIONS OF NORTH CAROLINA



In the coastal region of North Carolina, an even higher percentage of rare or endangered plant species are found in wetlands, an estimated 70 percent. This flat, wet region supports one of the most diverse groups of plant habitats and plants in the coastal plain.

Water levels have pronounced effects on coastal plain vegetation. As a result of the area's relative flatness, the water table is close to the soil surface; consequently, the slightest rise or fall in topography dramatically alters the amount of water available to plants. The coastal plain's rare and endangered plant species are primarily located in savannas, Carolina bays, marshes and lakes, although they are found in other wetland areas as well.

The piedmont has a low diversity of habitats, and consequently has a low diversity of rare plants. For this reason, most of the Plant Conservation Program's work is concentrated in the mountain and coastal plain regions. The rare and endangered species found are generally outside of wetland areas.

The Plant Conservation Program works closely with the North Carolina Natural Heritage Program, The North Carolina Nature Conservancy, and the North Carolina Botanical Garden in its work. The program also takes a preventative approach to plant preservation by offering educational materials to the public.

Flood Insurance Program, Department of Crime Control and Public Safety

The Division of Emergency Management administers the National Flood Insurance Program (NFIP), a program which enables

property owners to purchase flood insurance. Such insurance is designed to reduce the escalating costs of property damage caused by floods and is generally unavailable from private sector insurance companies. The program is based on an agreement between local communities and the federal government that if a community will implement programs to reduce future flood risks, the federal government will make flood insurance available within the community as a financial protection against flood losses which do occur.

While wetlands protection is not a focus of the NFIP, the program has served to develop local government policies which employ improved floodplain management. Careful management of new construction in floodplains has resulted in construction and land use practices which have served to reduce flood losses and the high costs of flood disaster. Less development in floodplains affords some protection to these wetland areas.

The availability of flood insurance, however, has sometimes been cited as a factor which has encouraged some floodplain development. It also has encouraged rebuilding of structures damaged by flood by providing insurance coverage for such purposes. Critics contend that coverage might better focus on relocation efforts, a longer term solution.

As of March, 1986, only 53 counties or municipalities identified as flood prone were not in the program. Three hundred and thirty had voluntarily joined.

LOCAL WETLANDS PROGRAMS

County and municipal governments throughout the State have acquired some wetlands directly for such purposes as resource

protection and greenways, or have included wetland areas as portions of larger areas acquired for park and recreation purposes. No figures exist for the amount of wetland acreage so acquired.

The primary means of wetland protection afforded by local governments has come from subdivision regulations and land use plans. In some localities, developers are required to set aside land for adequate open space and recreation use. Such land often includes wetland areas. Regulations also often prohibit or discourage floodplain development. Localities wishing to qualify for federally subsidized flood insurance must agree to adopt regulations which discourage building in areas of flood risk and which lessen the impact of development which does take place.

With land use plans, local governments develop a framework of policies to guide growth which includes community development, resource protection, and the protection of the environment. These locally developed land use plans affect local decision making. They are also used by the State's Lead Regional Organizations in their role as regional Clearinghouses for state and federally funded programs. Federal and state agencies must consider the growth policies of the local plans as they grant permits, create new facilities and programs, and fund local activities. Local land use plans are especially effective in the 20 coastal area counties where they are used as a major component in the granting or denial of CAMA/Dredge and Fill permits for development in coastal areas of environmental concern.

Building, sanitary, and other types of codes have offered additional protection for wetlands. For example, septic tanks

and soil absorption systems are required to be located away from high ground water areas or lakes and streams. Building codes may also require structures to be located outside of flood-hazard areas.

PRIVATE ORGANIZATIONS

The North Carolina Nature Conservancy

The North Carolina Nature Conservancy (NCNC) is the State chapter of The Nature Conservancy (TNC) a national organization dedicated exclusively to the conservation of the most important natural areas. The North Carolina Chapter devotes its resources to the identification and protection of the most significant examples of North Carolina's remaining forest, mountains, islands, and wetlands.

When critical habitat is threatened, The Nature Conservancy moves quickly to acquire it through gift or outright purchase, or to protect it through conservation easement, option, lease, or management agreement. The non-profit organization raises funds for such purposes from individuals, businesses, and foundations.

While The Nature Conservancy's interest in natural area protection is broader than wetlands, wetlands do comprise many of the significant natural areas which the organization seeks to protect. TNC works by identifying the most significant natural areas; by protecting them through acquisition by gift or purchase, or by assisting governments or other organizations; and by public education of the importance of natural diversity. TNC also manages Conservancy-owned preserves.

TNC and NCNC have assisted in the protection of over 266,000 acres of critical natural habitat in North Carolina. Over 185,000 of these acres have been acquired since NCNC was formed in 1977. While all of this acreage is not wetlands, a majority of the TNC/NCNC projects include some wetlands. NCNC currently manages 17 Conservancy-owned preserves in North Carolina.

The Nature Conservancy cooperates with interested local, state, and federal agencies and other private organizations in pursuing its mission.

Ducks Unlimited

Realizing that suitable habitat held the key to the success or failure of the waterfowl resource, Ducks Unlimited (DU) was founded in 1937 to help restore and rehabilitate prime waterfowl breeding grounds in Canada, where over 70 percent of North Carolina's waterfowl are hatched. Since its inception, DU has completed over 3,200 wetland restoration projects, having raised over $300 million which has been spent on wetland improvement and management. To date, over 4,000,000 acres of wetlands have been reserved through DU efforts.

DU does not focus on acquisition efforts. Instead, DU cooperates with government and individual landowners to secure free, long-term land leases and easements. Its Matching Aid to Restore State Habitats (MARSH) is now in operation in all 50 states. Under the new MARSH program, DU has worked with the North Carolina Wildlife Resources Commission to protect 3,750 acres of river swamp in Bertie County.

There are 116 chapters and 15,803 members of DU in North Carolina. The members raised $1,687,147 in 1986, 7.5 percent of which went into projects in the State.

North Carolina Wildlife Federation

The North Carolina Wildlife Federation (NCWF) is a branch of the National Wildlife Federation, the largest environmental group in the country. The NCWF is the largest private conservation organization in the State, with over 30,000 members and contributors. The NCWF is dedicated to the wise use and sound management of the wildlife and other natural resources of North Carolina.

Wetlands are a priority issue of the Federation. The NCWF has been very active in a variety of wetland concerns statewide by helping to study and identify wetland problems; by serving as a plaintiff in suits to block action detrimental to wetlands; by drafting and lobbying for legislation regarding storm water runoff, sedimentation control, etc., and by coordinating wetland protection efforts with EPA, USFWS, the Corps, and various state agencies.

# CHAPTER II

## EFFECTIVENESS OF EXISTING WETLANDS PROTECTION

A general consensus exists among federal and state agencies and other organizations that are involved with wetlands in North Carolina: protection of wetlands needs to be improved. At the same time, a realization exists that state, federal and local protection mechanisms have been valuable in reducing the wholesale alterations and losses of wetlands that once existed.

Wetlands protection is not uniform throughout all geographic regions of North Carolina. In the coastal counties, the Coastal Area Management Act, Section 404 of the Clean Water Act, and other laws and regulations combine effectively to protect salt marshes. However, only Section 404 of the Clean Water Act applies to wetlands throughout the State, and there are no state laws designed to protect wetlands outside of the coastal zone.

Wetlands protection is also not uniformly afforded to all types of wetlands. For example, annual losses of salt marshes are estimated by the Division of Coastal Management at no more than an acre annually, an indication of a high degree of protection. Pocosins, however, are a type of wetlands not adequately protected; losses to agricultural and ill advised silvicultural practices and development are substantial and continuing. Clearly, there are problems with the reach and degree of protection which North Carolina wetlands receive, especially relative to agriculture and silviculture.

Two state and two federal laws provide the bulk of protection afforded North Carolina's wetlands. The state laws,

the North Carolina Dredge and Fill Act (1969) and the North Carolina Coastal area Management Act (1974), are administered by the Division of Coastal Management. The federal laws, the U.S. River and Harbor Act (1889) and the Clean Water Act (1977) - better known as Section 10 and Section 404, are administered by the Corps of Engineers. The protection offered by these laws has helped preserve wetlands; however, it is clear that the protection offered has been limited.

State Regulatory Programs

The Coastal Area Management Act and the North Carolina Dredge and Fill Act have served well in accomplishing the purposes for which they were enacted. By requiring that development activities in areas of environmental concern be by permit only, good protection is offered to marshes subject to regular or occasional flooding by tides. Outside of AEC, but within the 20 coastal counties, any development requiring a state or federal permit of any kind, must be consistent with the Coastal Area Management Plan and local plans.

Wetland areas are clearly defined in the Acts, so the problem of what constitutes a wetland does not plague CAMA enforcement as it does the 404 program, where the determination of what constitutes a wetland are less clear. The regulated areas include ocean-front areas subject to erosion, storm flooding, and inlet movement; estuarine and public trust waters; coastal wetlands; a seventy-five foot wide buffer strip around estuarine waters; and several small surface watersheds and public well fields. By regulating these areas, CAMA is the most important state permit affecting wetland use.

In addition to approximately 950 general permits, approximately 275 major and minor CAMA permits are processed annually by the Division of Coastal Management. The permits have resulted in saltwater wetland losses being drastically reduced. In addition, the permit system has also encouraged state and landowner consultations prior to permit applications being filed. This interaction has undocumented effects of allowing a high percentage of permits to be granted (+97 percent) because of acceptable modifications made to project plans prior to the official permit process. Almost 25 percent of the CAMA permits cover residences; 29 percent are bulkheads; and 23 percent are piers, docks, boathouses, or walkways.

A large percentage of CAMA permits are issued with stipulations. Common stipulations are: "No wetland area may be filled", and "fill area must be planted with sufficient ground cover to prevent erosion and sedimentation into adjacent wetlands." Although permits are issued, such stipulations often minimize impacts to wetland areas.

To date, the Coastal Management Program has been effective in establishing a management framework, managing ocean-front development, and preventing gross environmental harm, such as the filling of salt marshes. CAMA's effectiveness has been due in part to its combination of planning, regulatory, land acquisition and policy development components, and to its coordination with local governments who adopt their own plans. Before CAMA instituted mandatory local land use planning in 1974, most of the rural counties and small municipalities in coastal North Carolina

had no comprehensive land use plans, and only a few had rudimentary zoning and subdivision ordinances. While the quality of individual plans varies, the plans have probably been the best method for addressing long-term general development issues, such as density of development, the character of coastal communities, and other traditional land use concerns. The plans have been most effective where there have been development pressures and sensitive resources. The planning efforts have also raised community awareness of the benefits of planning by delineating the links between development and its long-term effects and by requiring public involvement in plan development.

Approximately 22 percent of saltwater marshes were altered or destroyed between 1954 and 1968. Between 1970 and 1984, nearly 4,300 acres of coastal wetlands, mostly salt marshes, were altered by projects other than forestry or agriculture which were permitted under the existing laws, although about 90 percent of these losses occurred before CAMA was enacted in 1974. CAMA has proved to be effective in significantly reducing such losses.

The weakness of CAMA, from a wetlands protection standpoint, is that freshwater swamps and inland wetlands are not covered by the Act. CAMA also excludes certain activities from its definition of development and, therefore, exempts them from needing permits. These include agricultural and forestry activities which do not involve the excavation or filling of estuarine or navigable waters, and agricultural and forestry

ditches equal to or less than six-feet wide by four-feet deep. With these exclusions, CAMA does not regulate two activities which have accounted for substantial freshwater wetland losses.

The CAMA program may expand in the future to include such topics as coastal water quality, which would require management of urban, farm, and forestry runoff as well as better wastewater treatment. Other such topics may include protection of hardwood swamps, pocosins, and other freshwater wetlands; and managing potential large scale peat mining. Even so, any additional expansions in the program's scope would still only affect the coastal counties.

The CAMA program has also proved effective in streamlining the permit process by developing a joint application to cover CAMA permits, state dredge and fill permits, 401 water quality certifications, permits for an easement to fill state-owned lands, and 404 permits. This measure coordinates agencies as well as decreases state and federal policy overlap.

Federal Regulation Programs

The purpose of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. Thus, before dredged or fill material may be discharged into waters, the Corps of Engineers' 404 program requires that adverse environmental impacts and other impacts affecting the public's interest be evaluated.

Through coordination with the EPA, the Fish and Wildlife Service, the National Marine Fisheries Service and various state agencies, agency concerns regarding proposed projects are

considered. The Corps, however, must weigh a number of competing values in its decision. Wetland protection is an important value, to be sure, but so are other competing interests such as economic development.

Section 404, outside of the Coastal Zone where CAMA is effective, is the only government program regulating the development of wetlands. While it offers protection not otherwise provided, because of enforcement problems and the limited scope of the program, it has not been nearly effective enough in limiting wetland conversions.

The jurisdictional reach of the 404 program has been a debated issue for years. The Corps views its primary mission as protecting water quality; EPA, FWS, and NMFS consider wetland values and habitat to be a part of a broader mandate of the Clean Water Act. Judicial decisions thus far have had broader interpretations of the CWA than the Corps.

A major limitation of the 404 program concerns projects which convert wetlands by means that do not require the discharge of dredge or fill, which would require permits. For example, drainage, dredging and excavation, removal of vegetation, and other activities which affect wetlands would not be subject to Corps permitting, unless materials removed are discharged back into the wetland area. Developers have sometimes used this loophole to avoid 404 compliance.

With only six biologists for one hundred counties, the Corps is plagued by insufficient staff to support wetland related concerns. Lack of staffing may also relate to a narrower wetland

definition, for the Corps lacks adequate resources to effectively regulate activities in all waters of the state.

Exemptions from 404 permits also allow activities that convert wetlands, such as farming and silviculture; minor drainage; harvesting for the production of food, fiber, and forest products; construction or maintenance of farm or forest roads using best management practices; and construction or maintenance of irrigation ditches. There are other exemptions as well. The potential of wetland conversion from some of these exemptions is considerable. According to a 1978 study by Doucete and Phillips, farming and silviculture pose the most serious threat to wetlands in eastern North Carolina. Large agricultural and timber companies have extensive landholdings which include many wetland areas.

While the above paragraphs indicate how Section 404 falls short of the level of wetland protection needed, the program is nonetheless the most effective federal tool for regulating wetland development. The Wilmington District Corps issues permits for 90-97 percent of the applications involving Section 404 that it processes annually; it denies 3-5 percent of those applications. Approximately 95 percent of issued permits have been modified. NMFS studies in 1980 and 1981 showed 83 percent and 100 percent compliance with 404 permits within North Carolina.

The 404 process of pre-application meetings between individuals and state and federal representatives significantly decreases the wetland acreage altered by projects. Such meetings also serve to speed up the application process and increase the

percentage of permits issued. Without the protection offered by Section 404, North Carolina's wetlands would receive far less protection.

Summary of Wetland Protection

CAMA and the 404 program have combined effectively in the coastal counties to protect saltwater wetlands. The 404 program, while it has served to protect many wetlands throughout the State, contains limitations which allow many fresh water wetlands to continue to be altered or destroyed.

In spite of various state (primarily CAMA) and federal (primarily 404) laws protecting wetlands, and in spite of the efforts of other agencies and organizations interested in the wetlands of North Carolina, there are still several wetland types which are left largely unprotected. These include Carolina bays, bogs, pocosins, and bottomland hardwoods. Isolated wetands are unprotected because they are not joined to any stream or river system, or considered as an area of environmental concern, or are above mean high water.

At this time, there is not any proposed legislation or other changes which would afford protection of these important wetland areas.

# CHAPTER III

## STATUS OF WETLAND RESOURCES IN NORTH CAROLINA

North Carolina has not had a comprehensive survey of its wetland resources, although the State has been involved since 1983 with the National Wetlands Inventory (NWI) program of the Fish and Wildlife Service. The boundary for each wetlands map corresponds with a 7.5 minute U.S. Geological Survey topographic quadrangle, comprised of slightly less than 40,000 acres. In North Carolina, 955 of these maps cover the entire State. At this time, 229 wetland maps (24 percent of the State) have been completed. Most of the completed maps (178) have been in the coastal plain, making that region of the State 39 percent complete.

The NWI recognizes five systems of wetlands, as defined by the Cowardin Classification System: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. All five systems can be found in North Carolina, although approximately 95 percent of the State's wetlands are in the coastal plain. The classification scheme used for the NWI identifies wetlands through plant communities, soils, and hydrology, and it is useful for locating specific types of wetlands.

Acreage and diversity of wetlands can be determined with NWI maps. However, only a few of the maps have been used to determine wetland acreage at this point. As maps are completed and as requests are generated, the Division of Soil and Water Conservation will develop a resource base of this information. Acreage can be determined on a county basis, by watershed, or within a proposed project area. These data should allow

questions regarding wetland diversity or total acreage to be answered.

Until completion of the NWI, less comprehensive studies which have been performed in previous years will have to be used to obtain type, rarity, or diversity of wetland resources. Problems such as differences in definition of wetlands and comprehensiveness have hindered these earlier studies.

Spinner reported in 1968 that 206,350 acres of coastal marshland existed, and that an additional 14,700 acres had been destroyed between 1954 and 1968.

The U.S. Fish and Wildlife Service estimated that approximately 6,177,500 acres or 17 percent of North Carolina was covered by wetlands (Hefner and Brown, 1985). The State also has the largest estuarine system on the east coast, approximately 2,223,900 acres (Owens, 1981).

The most complete inventory of wetlands in North Carolina was performed by Wilson using data collected from 1957-1959. Wilson found that a total of 4,004,850 acres of wetlands existed in the forty-one coastal plain counties and estimated that 95 percent of the State's wetlands are located in that region (Wilson, 1962).

41 COASTAL PLAIN COUNTIES STUDIED BY WILSON

A summary of Wilson's findings follows:

Total Acreages of Wetlands by Type
41 N.C. Coastal Plain Counties

| Wetland Type | Acreage |
|---|---|
| Bottomlands | 458,950 |
| Inland Open Fresh Water | 88,100 |
| Wooded Swamps | 988,500 |
| Bogs (Pocosins) | 2,262,950 |
| Shallow Fresh Marsh | 47,500 |
| Irregularly Flooded Salt Marsh | 100,450 |
| Regularly Flooded Salt Marsh | 58,400 |
| Total | 4,004,850 |

Wilson's survey used the U.S. Fish and Wildlife Service's circular 39 classification system and was designed to locate land which was suitable for waterfowl. Since Wilson's study, various sources have updated acreage estimates for pocosins, bottomland hardwoods, shallow fresh marsh, regularly and irregularly flooded salt marsh, and deep swamps. The update of estimates follows:

State of North Carolina
Estimates for Wetland Acreage

| Type | Acreage | Source |
|---|---|---|
| Pocosins | 602,134 | Richardson, 1982 |
| Bottomland Hardwood | 2,691,989 | U.S. Forest Service, 1974 |
| Shallow Fresh Marsh | 47,016 | Burdick, 1967 |
| Salt Marsh | 113,558 | Burdick, 1967 |
| Deep Swamps | 450,255 | U.S. Forest Service, 1974 |

Acreage figures from Wilson's 1962 study and the latest estimates are difficult to compare because of varying categories and definitions of wetland types. For example, Wilson's figures for bottomlands, wooded swamps, and swamps would all fall under the U.S. Forest Service's bottomland hardwood acreage figure.

North Carolina ranked third among southeastern states as of the mid-1970s in the number of wetland acres (5,690,000). Hefner and Brown estimated that wetland acreage comprised 16.9 percent of North Carolina, the fourth highest percentage in the southeastern United States (Hefner and Brown, 1985).

# CHAPTER IV

## WETLAND TRENDS IN NORTH CAROLINA

Wetlands have become a public policy issue in North Carolina because of conflicts between those who wish to develop them and those who wish to preserve them. Wetlands have traditionally been viewed as prime locations for development because of their typical proximity to open water, and many have been drained or cleared for agricultural or silvicultural purposes.

Undeveloped wetlands, however, have important intrinsic qualities that are aesthetically pleasing and that provide varied ecological services that benefit society. The public's perception that wetlands were wastelands existed for many years and still lingers. It is not surprising, considering such an attitude, that many have been converted to other uses or altered.

The lack of comprehensive studies regarding wetlands precludes an accurate determination of trends and rates of loss of wetlands in the State. However, by using data from previous studies, a picture of how wetlands have been lost or altered, especially pocosins, marshes, and bottomland hardwoods, can be assembled.

In 1962, Wilson found 2,262,950 acres of bogs (pocosins) in North Carolina. Up until that time, probably less than 10 percent of the pocosin areas had been altered from their natural state. During the 17 years following Wilson's study, 740,000 acres or 33 percent of pocosins were totally developed. These areas were ditched and drained, had natural vegetation removed, and had soils prepared for other uses. Thirty-six percent of

pocosin areas (808,000 acres) can be characterized as being in transition. Transition pocosins have been partially drained, cleared, cut, disturbed, or planned for development. Only 31 percent of pocosins (695,000 acres) still exist in a natural state (Richardson, 1982).

Sixty-five percent of pocosin wetlands in North Carolina are owned by agricultural and forest products industries. In the past, these industries' needs have required either complete or partial drainage of pocosin areas. Only 5 percent of pocosins are protected from drainage through public ownership or are under lease for wildlife purposes (Richardson, 1981)

Pocosins are clearly a threatened wetland resource in the State. As noted in previous chapters, existing protection mechanisms generally do not offer protection which would prevent conversion to other uses. With approximately 44 percent of pocosins owned by major timber companies and 21 percent by large agricultural corporations, and because most undeveloped pocosins are drainable, significant additional conversion of pocosin areas is likely to occur in order for these companies to capitalize on their investments (Richardson, 1981). Because drainage of wetlands for agricultural purposes is expensive, it is more likely to be done by large agribusinesses than by smaller farm operations. Additionally, large agribusinesses are more likely to be able to survive without USDA price supports, so the provisions of the "swampbuster" bill would have less impact than on smaller farm operations.

Factors which have contributed to the loss of wetlands can be determined in general terms using NWI maps and soil surveys from the Soil Conservation Service. Hydric soils, in a natural state, are considered wetlands if existing vegetation requires saturated or seasonally inundated soil conditions for growth. By comparing hydric soil units from soil surveys with NWI wetland units, an estimate of wetland loss can be determined. Nationwide, an estimated 87 percent of wetlands lost have been due to agriculture or silviculture practices (Tiner, 1984).

The FWS has identified pocosins of the coastal plain as being a national problem area of wetland losses. North Carolina has 70 percent of the nation's pocosins, but without additional protection, the loss or degradation of pocosin wetlands will surely continue.

Agricultural conversions of wetlands should be significantly reduced by the "swampbuster" provision of the 1985 Farm Bill. Under this provision, a farmer who converts wetlands to agricultural use loses all Department of Agriculture crop supports. Eighty percent of farmers nationwide participate in USDA agricultural subsidy programs, and it is unlikely that farmers would risk losing their subsidies by converting wetlands. The provision applies to wetlands which have not been farmed since 1981 and the conversion of existing wetlands to cropland.

The "swampbuster" legislation corrected a long-standing conflict in federal policy. For many years, farm supports and tax advantages encouraged farmers to put as much land as possible

into production, including wetlands. Other federal programs encouraged wetland preservation.

The 404 program and CAMA have done much to regulate the use of marshes since 1974. Estimates of marsh loss, however, are still scant. Spinner (1968) estimated that 14,700 of 206,350 acres of marsh (7.1 percent) were destroyed between 1954 and 1968. A much higher percentage, 22.2 percent, was cited by Burdick (1967) as being altered. The difference in percentages may be due to Burdick's use of the term "altered" and Spinner's use of the term "destroyed".

In Stockton and Richardson's analysis of wetland trends in coastal North Carolina from 1970 to 1984, an analysis of 15 years of permitting records was performed. It was determined that the total amount of coastal wetland areas altered under permits during this time was 4,300 acres, almost 2 percent of the salt marsh wetlands along North Carolina's coast and 1 percent of all State wetlands. However, while the number of permits issued steadily increased during the 1980s, the amount of wetland loss decreased each year. Also, a few large projects in the early 1970s accounted for close to 70 percent of all developed wetland areas during the 15-year period.

The Stockton/Richardson study divided wetland areas into four categories: wooded swamps, high marshes, low marshes, and other wetlands. Of all the permits that affected vegetated wetlands, 60 percent involved the alteration of high marshes. High marshes are easier to develop: They excavate easier than wooded swamps; they often have direct access to open water,

facilitating conversion to boat basins, canals, and marinas; and they are easier to fill than low marsh areas.

Bulkheads, canals, and filling activities made up 80 percent of permitted projects. Although 62 percent of permits were issued to private landowners, this group only accounted for 16 percent of the losses of wetland area. Utility companies were responsible for 46 percent of the permitted wetland loss, although they only accounted for 1 percent of the permits issued.

Agricultural and forestry practices are exempt under CAMA laws and, therefore, the Stockton/Richardson study did not measure their effects on wetland alteration. Interior freshwater wetlands, not under the purview of CAMA or Section 404, were also not included in the study.

Stockton and Richardson found that low marsh areas have been well protected by wetland laws. Because these areas are below the mean high water mark, they are considered public land; as public land, they face less development pressures.

The Soil Conservation Service (USDA, 1977) estimated that approximately 35 percent of inland wetlands, mostly wooded swamps and bogs, have been "lost or altered" since Wilson's 1962 study. The SCS based its data on field studies of ten sample counties in the State.

North Carolina has had a trend towards an increasing loss of bottomland hardwoods since 1955, according to data from the Southeastern Forest Experiment Station. The data showed that the 10.9 percent alteration of commercial forest land from 1964 to

1974 almost doubled the 6 percent alteration seen from 1955 to 1964. This decrease in bottomland hardwoods stems largely from increases in agricultural lands. Total bottomland hardwood acreage in 1955 was estimated at 3,198,700 acres (Larson, 1957); 3,014,700 acres in 1964; and 2,691,989 acres in 1974 (Knight and McClure, 1966 and 1975).

Bottomland hardwoods have been reduced through stream channelization, dams, drainage, and development. Flood control efforts and more advanced technology for drainage and land clearing has had its effects. While forestry practices are generally not as damaging as agricultural development is to bottomland hardwoods, draining, clearing, and conversion of sites to grow a single kind of tree can be nearly as damaging as agricultural clearing. Highway construction, urban expansion and other development continue to threaten bottomlands, particularly when they alter or block normal flooding and drainage patterns. As North Carolina develops, such factors can be expected to increase.

In 27 of the eastern counties of North Carolina, large forest industries own approximately 1.6 million acres, 400,000 acres which are wetlands (Hall et al, 1982). Of all the wetland types, pocosins have the greatest potential and are under pressure for production of saw timber and pine pulp (Wilson, 1962). Wooded Carolina bays are also under pressure from forest industries because of ease of drainage. It has been estimated that 95 percent of the Carolina bays have been altered, mostly from agricultural or forestry purposes (Sheritz and Gibbons, 1981).

In 1978, Doucette and Phillips estimated that forestry and agricultural interests had caused 31.6 percent of all the wetlands in 17 coastal counties to be drained. They also found that if all the potentially drainable land was drained by these two industries, 66 percent of the wetlands in the 17 counties would be altered.

The forestry industry has been responsible for partially draining 337,000 acres of North Carolina's wetlands, while agriculture has drained 230,000. Forestry interests also own more potentially drainable land than agricultural interests, and more than 44 percent of pocosin wetlands (Richardson, 1981).

In past years, ditching and draining for mosquito control was a large activity which altered coastal salt marshes, estimated at 31,551 acres by Burdick (1967). Since Burdick's study, ditching for mosquito control has fallen out of favor and is now rarely performed.

Urban development and second home development have had an impact resulting in wetland loss in North Carolina. This impact has been considerably lessened since the requirement of permits for dredging and filling. There are other impacts, however. Runoff of storm water from developed areas into marshes and swamps as well as sewage discharge still threaten wetlands. Development pressures and concomitant impacts are likely to increase. Burley (1979) found that the number of recreational lots in coastal counties was 83,690 compared with 20,530 leisure homes in 1970.

Summary

There are many factors which have caused significant damage or loss of wetlands in North Carolina. Some of these factors, such as ditching for mosquito control or filling of salt marsh, are not the problem they once were. Still, there are combinations of pressures from several industries and activities which continue to result in alteration and destruction of wetland resources.

The forestry and agricultural industries own significant amounts of wetlands, areas which are generally unprotected by CAMA or Section 404 regulations. The trend has been towards wetland conversion to forestry and agriculture. Urbanization and second home development also indicates continued pressure to develop wetlands. Agricultural conversions of wetlands should be significantly reduced since the passage of the "swampbuster" bill. However, conversion for intensive or managed forestry is not restricted or regulated at this time.

Because of the uniqueness of North Carolina's various regions and because of varying degrees of protection statewide, determination of activities that have the greatest adverse impact on wetlands should be made on a regional basis.

# CHAPTER V

## WETLAND PROTECTION ALTERNATIVES

Realizing the multiple values of North Carolina's wetlands and the substantial conversion and altering of wetlands which has taken place over the years and which still continues, consideration should be given to a full evaluation of wetland resources and threats and the development of additional wetland protection measures.

The most effective method of protecting, preserving and conserving wetland resources would be acquisition of such areas by governmental bodies. With the power of eminent domain, fee simple title to critical wetlands could be acquired. Lesser interests than fee simple could also be acquired. However, acquisition by any means is a preservation technique that is limited to the extent that "just compensation" is required to take possession. While acquisition would be effective, it is unlikely that sufficient monies would be available to focus on this preservation method.

Public ownership has provided substantial protection to saltwater marshes in the State, but most riverine and inland wetlands are not in public ownership and are subject to market forces which increase the likelihood of conversion or alteration. While some inland wetland areas have been acquired as game lands, parks, or natural areas, most are unprotected. While money available for land acquisition has been and will continue to be limited, the possibility exists of focusing acquisition efforts on wetlands.

Another effective method of preservation would be the expansion of regulations dealing with permitted uses of wetlands. The State is not required to compensate property owners if regulations which are imposed do not deprive owners of all reasonable economic use of their land and if the regulations are reasonably drawn to achieve the desired results. Expansion of flood plain zoning or CAMA's jurisdiction would be examples of the use of regulations that would aid wetland protection. Regulations could be expanded to eliminate loopholes, reduce exemptions, and include wetland types not currently protected. New comprehensive wetlands legislation might be most desirable from a protection standpoint, for no single legislative authority addresses all facets of wetland protection or use.

The most serious threats to wetlands in eastern North Carolina are from large-scale agricultural and forest product companies which own extensive amounts of wetlands. To effectively protect these wetland areas, exemptions for "normal agriculture" and "normal silviculture" will need to be removed or certainly better defined, and regulations developed to protect these areas. Such action would offer considerably more protection to pocosins, Carolina bays, and bottomland forests.

Agricultural and silvicultural interests and wetlands protection present sensitive political and social issues. Changing attitudes and statutes would require sound data for justification and close coordination with support and opposition interests. With good technical information and its educational use, public support for change should be enhanced.

In North Carolina, freshwater wetlands have received less attention than coastal wetlands, and primary protection for inland wetlands has come from Section 404. Consequently, freshwater wetlands are the most threatened of North Carolina's wetland areas, and specific actions are needed to protect these more vulnerable wetland.

To date, nine states have enacted freshwater wetland protection laws, with Florida being the only such southeastern State. Common components of these laws are mapping, defining wetlands, the permitting of wetland alterations, and enforcement procedures and penalties for noncompliance.

Completion of mapping of wetland areas is necessary to aid in the development of management strategies. North Carolina's mapping efforts and use of such data as the NWI, needs to proceed at a faster rate. With the development of such data, a program to identify those individual wetlands of most significant value to the State can be initiated. Once this is done, consideration can be given to providing some additional protection. The NWI should prove to be a useful tool to governments as well as private citizens. Use by city and county planners should become standard practice. They may also be used by developers to avoid wetland areas.

Expansion of wetland laws and concomitant increased permitting activity would necessitate additional personnel to evaluate and process permit applications. An objective evaluation system by which various wetlands could be analyzed to determine their specific value to communities and the State would

need to be developed. Efforts to coordinate state wetland assessment criteria with the efforts being made at the federal level should be made.

Establishment of a standardized and practical definition of wetlands for all State agencies would be helpful. Projects are now reviewed for wetland impacts by various agencies that use differing definitions of wetlands which cause strife over wetland boundary delineation. Concerns of these agencies with respect to wetlands also vary, and a coordinated State policy dealing with wetlands is essential. To facilitate cooperation and coordination with federal agencies, the Cowardin system of wetland classification could be adopted. Wetland values to be protected by State laws and regulations need to be clearly defined as well. Water quality, fish and wildlife, flood control, recreation, flora, ground water recharge, food-chain support, food and habitat, and shoreline stabilization are all concerns which need addressing when overall wetland policy is formulated.

As discussed in Chapter I, there are many state agencies that handle programs that protect wetlands. Inconsistency in policy can often result. Additionally, agency personnel often have other job responsibilities. Inconsistency is also present at the federal level. A central state agency or a lead agency to initiate a wetland management program which would recognize the vulnerability and desirability of wetlands could be considered. An executive order from the Governor's office could be used to establish State policy regarding wetlands. Simply requiring

state administrators to take into consideration the effects of their actions on freshwater wetlands could help prevent the conversion or degradation of some wetlands.

Compensating landowners for protecting wetlands could significantly decrease the conversion of wetlands to agricultural and silvicultural uses. Such compensation can take the form of reduced ad valorem tax, or it could be, as currently exists in North Carolina, as a state income tax credit for property or interests in property donated for conservation purposes. Currently the credit set at 25 percent of the fair market value of the donated property interest, up to a maximum credit of $5,000 for a taxable year. Consideration could be given to raising the percentage credit or maximum credit amount and better publicizing the tax advantages, federal and state, of conservation gifts.

Development of adequate techniques and follow-up case histories is needed to evaluate the impacts of wetland projects, including cumulative impacts. To use water quality as a basis for protecting wetlands, technically defensible data must be developed. Problems of storm water control and fresh water runoff into saline areas which negatively affect marine life need to be better documented. Research efforts are needed to evaluate various development activities such as wastewater treatment, mining, and agricultural runoff. Data on wetland acreage loss permitted by state and federal regulatory agencies needs to be kept to assess regulatory program effectiveness and wetland loss.

Greenways are increasingly important parts of local governments' park and open space plans. These linear parks,

usually located along creeks or river systems, maintain open space, offer recreational opportunities, provide for flood control, and protect wildlife habitat. Greenway areas can be acquired by purchase and through requirements built into the development process. The President's Commission on Americans Outdoors Citation concluded that the best way to protect the outdoors was by public concern in communities throughout the country. The Commission also recommended creation of a network of greenways to tie together parks and natural areas. If a new program succeeds the Land and Water Conservation Fund Program, or if the LWCF Program continues past 1989 in some amended fashion, greenways are likely to receive more emphasis than has existed since the program's inception in 1965.

The State might consider producing public service announcements in an effort to raise the level of public education regarding the value of wetlands. Workshops for city and county planners and local officials might also be held. Informed local governments would be better able to communicate wetland values to citizens and developers.

The value of education should not be overlooked as a protection strategy. As coastal wetland problems became more acute, more and more citizens realized that steps needed to be taken to preserve marsh areas and protect marine life. With such realization came increased public support for action, and the Coastal Area Management Act was passed. Before inland or forested wetlands become more severely impacted or reduced, efforts need to be made to change the way the public, the

individual landowner, and local governments perceive wetlands. Ultimately, understanding the value and vulnerability of wetlands and concomitant action offer the best protection.

The Clean Water Act Regulations "Antidegradation" clause is beginning to be used to protect wetlands. Antidegradation requirements seek to protect and maintain existing instream uses and the level of water quality necessary to protect those uses. Since a wetland's natural processes may affect or determine an existing use, alterations to natural processes that change existing uses may not be allowable.

An interagency task force met in September to discuss effectiveness of existing wetland protection, alternative methods of protection, and acquisition priorities for wetlands. The task force agreed to meet in a few months to further discuss wetlands and actions the State could take to enhance wetland protection.

# CHAPTER VI

## WETLAND ACQUISITION PRIROITIES

Wetland acquisition priorities at this point in time need to focus on wetland types which are presently not adequately protected. These types include Carolina bays, mountain and piedmont bogs, pocosins, and bottomland hardwoods. Isolated wetlands are largely unprotected because they are not joined to any stream or river system and are not considered Areas of Environmental Concern by CAMA, or because they are above mean high water.

The Wetlands Planning Task Force organized to assist in the development of the SCORP wetlands addendum recommended that the Natural Heritage Protection Plan be used to identify priority wetland acquisition areas. The Natural Heritage Protection Plan was developed by the North Carolina Natural Heritage Program. The Natural Heritage Program is the unit of the Department of Natural Resources and Community Development's Division of Parks and Recreation which is responsible for identification and protection of North Carolina's exceptional natural areas and biological resources.

The North Carolina Nature Preserves Act of 1985 declared it state policy to identify and protect significant natural areas and provided statutory authority for the operation of the Natural Heritage Program, which had been established in 1976 by initiative of the Department of Natural Resources and Community Development. The Nature Preserves Act further established a state system of protected natural areas, either by arranging voluntary protection agreements with landowners (the State

Registry of Natural Heritage Areas) or by legally dedicating nature preserves (with full or partial interest ownership by the State of North Carolina). By late 1987, voluntary registry agreements had been arranged with private and public owners of more than 230 natural areas, and five nature preserves had been dedicated. The Natural Heritage Program hopes that at least 500 natural areas statewide will be registered or dedicated by the end of this century.

The North Carolina Nature Preserves Act requires that the Natural Heritage Program prepare a biennial protection plan to set priorities and govern efforts for protection of natural areas. Development of that plan is partially supported by the National Park Service's SCORP planning grant to North Carolina. The current natural areas priority list contains 738 natural areas in North Carolina which are ranked on the evaluation of possessing natural resources of national, statewide, or regional significance.

The Natural Heritage Protection Plan provides direction for the addition of new areas to the State Registry of Natural Heritage Areas and to the Dedicated Nature Preserves System. The plan also recommends natural areas that may best be protected by acquisition by public or private conservation agencies. Specific contents of the plan include:

- priorities for future inventory and protection efforts;
- criteria for selection of priority natural areas;
- procedures and alternative methods for protecting threatened elements of natural diversity and priority natural areas;

- 1986 priority natural areas list;
- recommended protection strategies for priority natural areas; and
- recommended roles of various agencies for assuring the protection of those areas.

The plan should assist the North Carolina Division of Parks and Recreation, other state and federal agencies, the North Carolina Nature Conservancy, and other private land conservation organizations in determining protection priorities and implementing policies to protect the full range of natural diversity in North Carolina.

A large percentage of the sites identified by the plan as high priority natural areas are associated with wetlands. Nearly 50 percent of the natural areas on the priority list are wholly or partially wetlands. The North Carolina Natural Heritage Protection Plan includes recommendations on site-by-site basis for the protection of these wetland natural areas by registry agreement, acquisition, or dedication.

As the statewide inventory of natural areas and rare species habitats progresses, more comprehensive information will enable the Natural Heritage Program to identify and evaluate more important sites and to define protection priorities more completely.

The North Carolina Natural Heritage Protection Plan is available from the Natural Heritage Program, Division of Parks and Recreation, P.O. Box 27687, Raleigh, North Carolina 27611.

# CHAPTER VII

## WETLAND ISSUES OF NATIONAL CONCERN

It is clear from studying wetland trends that not enough is being done to protect the nation's wetland resources. While progress has and continues to be made, there are, as this document points out, still serious gaps in wetland protection. As wetlands are a national concern, the federal government, in concert with state and local governments and the private sector, must take steps necessary to close these gaps.

The following actions should be considered by the federal government in an effort to strengthen protection of wetland resources:

- The Corps of Engineers needs a clear jurisdictional directive which would clarify wetlands which fall under the 404 permitting program. The Corps also needs additional staff to better administer the workload in North Carolina. A clearer definition of normal agriculture and silviculture needs to be made.
- Consideration should be given to the establishment or designation of a federal agency to extend the jurisdiction of wetland regulations so that wetland areas not now protected by Section 404 would be afforded protection.
- The completion of the NWI for North Carolina should be a top priority.
- Additional emphasis should be placed on public education regarding the multiple functions and values of wetlands and

the threats which wetlands face. Better understanding of the values of wetlands and the problems that their conversion might cause would aid protection efforts.

- Additional research to establish the values, effects, and costs of various wetland actions is needed. Improved research data would aid policy development and management decisions. A primary research agency for wetlands should be designated, and interagency coordination of wetland research should be enhanced. EPA would likely be the federal agency to assume this role.
- Federal action to support state wetland protection programs is warranted. Support could be in the form of technical and financial assistance, federal oversight, a centralized data base, research, and acquisition funds.
- Investigate the feasibility of acquisition of former wetlands in situations where the loss or degradation has not been irreversible and restoration is possible.
- Amend the National Flood Insurance Act of 1968 to discourage rebuilding of structures substantially damaged by flood. Emphasis could be placed on relocating structures where feasible. The act should also prohibit filling of fringe areas of flood areas.
- Amend the Clean Water Act to require 401 water quality certifications in situations where federal permits are not required.

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